

MEMORANDUM OF AGREEMENT
Between the
Federal Aviation Administration (FAA)
and the
National Aeronautics and Space Administration (NASA)
Concerning
Commercial Space Transportation Infrastructure Development

I. Purpose

This Memorandum of Agreement (MOA) establishes a strategic partnership between the NASA Office of Space Flight and the FAA Office of the Associate Administrator for Commercial Space Transportation (AST), with respect to identifying advanced spaceport and range technologies and the development of safety requirements and standards for future commercial space transportation operations. This MOA includes collaboration between the FAA and NASA to augment FAA capabilities and expertise with NASA provided training in range operations and range safety topics.

II. Background and Rationale

In the future, commercial spaceports and ranges are envisioned to meet the demands of the emerging commercial space industry by providing safe, cost-effective access to space on a regular basis. Safety must be maintained as this growing industry develops and seeks the approval of new orbital vehicles and launch/recovery sites. New technologies, systems, and operating concepts will be required for these spaceports and ranges.

The *Commercial Space Launch Act*, as amended in 1989 and 1998, directs the FAA to promote and regulate the commercial space industry. As a result, AST licenses commercial launch/reentry sites and ensures that commercial space transportation systems and their operations are safe. NASA's mission, in part, is to pioneer the identification, development, application, and commercialization of space technologies.

The Kennedy Space Center (KSC) has been designated the NASA lead for spaceport and range technology development and demonstration and is the NASA lead for these activities under this MOA. NASA also operates the only non-USAF Federal orbital launch range. The Wallops Flight Facility (WFF), operator of the orbital launch range, is the NASA lead under this MOA for the NASA provided training at the WFF as well as collaboration concerning specific commercial licensing activities at the WFF. Other NASA Centers and Facilities will participate as appropriate.

III. Objective/Scope

The objective of this MOA is to establish an expanded working relationship between NASA and the FAA, and to provide a mechanism for the most effective use of limited resources in advancing the development of the national commercial space transportation infrastructure. For the purposes of this MOA, commercial space transportation infrastructure development includes activities associated with the research, design, development, demonstration, and/or technology transfer of technologies, systems, equipment, processes, operating concepts, and facilities associated with spaceports and ranges. This MOA also provides for the sharing of information and training of personnel in the areas of range operation and safety and commercial licensing activities.

There are four basic areas of collaboration under this MOA:

1. Research, development and demonstration of spaceport and range concepts and technologies;
2. Development of requirements and standards for commercial space vehicle systems, launch and reentry sites, and facilities;
3. NASA provided range operations and range safety training to the FAA at the WFF.
4. Collaboration concerning specific commercial licensing activities associated with NASA's Wallops Flight Facility.

When appropriate, specific plans will be prepared in accordance with Section IV below to provide for the authorization and transfer of funds between agencies, and to use NASA and FAA research and operational facilities. This MOA does not limit the use of other resources by NASA, the FAA, or by other organizations required to accomplish their respective missions, nor does it modify or limit any existing roles or responsibilities.

IV. Implementation

A. NASA shall:

1. Provide appropriate opportunities for the FAA to participate in NASA's program, project, and Center of Excellence planning process so that the FAA may make strategic decisions regarding regulatory actions associated with developing a national commercial space transportation system;
2. Have the lead responsibility as chair of the Advanced Spaceport Technology Working Group (ASTWG) and co-chair of the Advanced Range Technology Working Group (ARTWG) in identifying, assessing, validating, and demonstrating candidate technologies for concept development;
3. Coordinate and conduct field trials and technology readiness demonstrations, research, and testing at existing or proposed operational launch/reentry facilities;
4. Participate in the FAA Commercial Space Transportation Advisory Committee (COMSTAC) and related working groups;
5. Support the commercialization of spaceport and range concepts and technologies by providing technical guidance.
6. Augment FAA capabilities and expertise with NASA provided training in range operations and range safety topics conducted at a NASA-operated launch range (WFF).

B. FAA shall:

1. Provide appropriate opportunities for NASA to participate in FAA/AST program and project planning so NASA may make strategic decisions associated with spaceport and range research and technology development;

2. Support the identification, assessment, validation, and/or demonstration of candidate commercial spaceport and range concepts and technologies;
3. Facilitate and support field trials and technology readiness demonstrations, research, and testing conducted at existing or proposed operational launch/recovery areas and facilities;
4. Participate in NASA's ASTWG and ARTWG.

C. Both NASA and the FAA shall:

1. Identify collaborative projects and establish an approach to managing work to be performed under this MOA;
2. Coordinate to prioritize projects with agreed responsibilities for each activity, including the funding sources, levels of effort, and the application of resources;
3. Coordinate technology projects with the ARTWG and ASTWG to enable synergy and avoid duplication. However, these projects will not be subject to approval by the Working Groups.
4. Share pertinent information associated with planning, approval, and licensing of launch-related activities under the jurisdiction of the FAA and conducted at the WFF.
5. Transfer technology as appropriate per approved NASA and/or FAA processes.

D. Technical Areas of Collaboration

Examples of potential areas of collaboration under this MOA are listed below. Other areas may be explored, as appropriate.

- Launch operations facilities and systems
 - Launch vehicle maintenance/processing/assembly
 - Payload processing
 - Launch/landing/runway complexes
 - Launch/checkout/operations control centers
 - Vehicle/ground system and equipment support
 - Multi-modal transportation (air/land/sea/space)
 - Crew/operations/maintenance training
 - National Airspace System integration
- Range operations facilities and systems
 - Range operations control centers (command, control, and communications)
 - Surveillance, tracking, weather, and telemetry systems
 - Range safety systems and procedures
- Other
 - Propellant production, storage, handling, and transportation
 - Utilities (power, water, waste, etc.)
 - Buildings and land-side design
 - Environmental considerations
 - Emergency services
 - Local operations
 - Security

E. Funding and Liability

Under this MOA, and as implemented via documentation mentioned in subsection F below, this collaboration will be on a reimbursable and/or non-reimbursable basis between NASA and the FAA. This MOA will not serve as authorization for NASA or the FAA to commit financial or other resources between NASA and FAA, nor by NASA or FAA to third parties. Any authorization for such expenditures will be stated in the documentation of implementation efforts mentioned in subsection F, and shall be consistent with the applicable authority and operating plans of NASA and FAA. Upon obtaining the appropriate approvals, and necessary funding, NASA and FAA may utilize their respective statutory and regulatory authority to award contracts, grants, cooperative agreements, and other transactions that support this collaboration.

Resource commitments are subject to availability of those resources and subject to availability of appropriated funds. NASA and FAA agree to assume liability for their own risks associated with the activities pursuant to this MOA and as documented in writing by the agencies.

F. Project/Implementation Plans

This MOA establishes the parameters for collaboration between NASA and FAA. All implementation efforts pursuant to this MOA, whether reimbursable or non-reimbursable, will be documented in writing, and be signed by appropriate NASA and FAA officials. The form of documentation will be appropriate to the complexity of and resources committed to the effort.

When appropriate, Project/Implementation Plans shall be developed. These plans shall detail the objectives, scope, elements of performance, resources, responsibilities, authorities, schedule, and products associated with work to be performed. Each plan shall be approved prior to performing any work or tasks identified under the plan. All plans and other agreements entered under this MOA shall conform to applicable federal statutes, regulations, orders, and directives including agency-specific legislation. If developed, the plans shall be authorized on a case-by-case basis for each task or project.

V. Technical Representatives

The following positions are responsible for the oversight of this MOA for their respective agencies, however, they do not have the authority to unilaterally alter the terms of this MOA:

1. Manager, Space Systems Development Division, AST-100
FAA Office for Commercial Space Transportation
(Current Incumbent: Herbert Bachner)
2. Manager, Systems Engineering and Training Division, AST-300
FAA Office for Commercial Space Transportation
(Current Incumbent: Hugh Cook)
3. Director, Spaceport Engineering and Technology, YA
NASA, Kennedy Space Center
(Current Incumbent: James Heald)
4. Chief, Policy and Business Relations Office
NASA/GSFC/Wallops Flight Facility
(Current Incumbent: Bruce Underwood)

The Technical Representatives, or their successors, will resolve any disputes, which may arise under this MOA, in accordance and compliance with appropriate FAA and NASA policies and procedures.

VI. Dissemination of Information

NASA and/or the FAA may disclose or publish results obtained from the performance of work pursuant to this MOA, independently or jointly. Press releases, reports, papers, and other materials, which are produced as a result of this partnership, must be coordinated prior to release. To the extent permitted by applicable Federal laws and regulations, the initial release of any information to the public concerning results or conclusions made in performance of tasks under this MOA shall require prior written approval of the FAA and NASA Technical Representatives identified in Section V.

VII. Period of Performance

This MOA shall become effective upon the signing of the last approving party identified in Section IX, and shall remain in effect for a period of five years unless terminated by mutual agreement under the process outlined in Section VIII.

VIII. Modifications/Amendments/Termination

No verbal or written statement by any person other than NASA and FAA signatories, their successors, or their designees, acting within the scope of their authority, shall modify or otherwise affect the terms of this MOA. Any changes to the terms, conditions, or scope shall be in writing and executed in accordance with each agency's policies and procedures. Modifications, at a minimum, shall include an identifying number, title and the effective date.

Either party may terminate this MOA 90 days after written notification of intent to terminate. Termination requires that the Technical Representative of the initiating party write a modification (purpose only) stating the subject MOA is to be terminated, its identifying number, title and effective date of the termination. Upon termination, each agency will refund any portion of those funds that have been advanced to the other agency, but not expended, in connection with the work specified in the MOA.

IX. AUTHORITY

A. NASA

The legal authority for NASA to enter into this agreement is found in section 203 (c) of The National Aeronautics and Space Act of 1958, as amended, 42 U.S.C. 2473 (c).

B. FAA

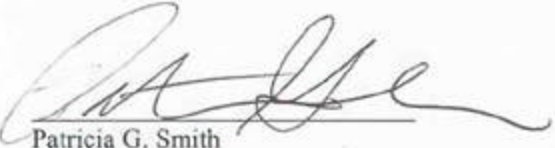
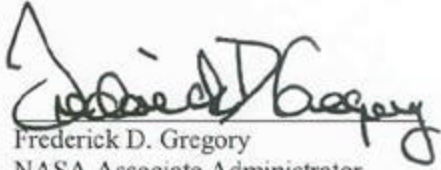
This MOA is entered into on behalf of FAA under 49 U.S.C. §106 (l) (6), and (m). The FAA/NASA Memorandum of Understanding (MOU) concerning Future Space Transportation Systems, dated October 28, 1999, is referenced.

C. Transfer of Funds

To the extent funds may be transferred between FAA and NASA for services and/or goods provided on a reimbursable basis, transfer shall be by authorized method of funding transfer.

X. Approvals

By our signatures below, we hereby indicate our agreement as outlined in this MOA between the NASA and the FAA.

 Patricia G. Smith FAA Associate Administrator for Commercial Space Transportation	 Frederick D. Gregory NASA Associate Administrator for Space Flight
Date: <u>8 May 02</u>	Date: <u>3 May 02</u>